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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,627	03/01/2004	Brad N. Mathiowetz	P32.12-0022	1342
27367 7590 02/28/2011 WESTMAN CHAMPLIN & KELLY, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402			EXAMINER CHUO, TONY SHENG HSIANG	
			ART UNIT 1729	PAPER NUMBER
			MAIL DATE 02/28/2011	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/790,627

Applicant(s)

MATHIOWETZ ET AL.

Examiner

Tony Chuo

Art Unit

1729

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/3/11
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Claims 1-7 are currently pending. Claims 8-35 are cancelled. The previous objections to claims 1 and 8 are withdrawn. The amended claims do not overcome the previously stated 112 and 103 rejections of claims 1-7. Therefore, upon further consideration, claims 1-7 stand rejected under the following 112 and 103 rejections.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 2/3/11 was filed after the mailing date of the Non-Final Rejection on 10/27/10. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

3. Claim 1 is objected to because of the following informalities: the phrase "a parallel planes" should be changed to "parallel planes". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "each half shell comprising: ... a outer layer of thermally insulating material ..." is not supported by the specification. The specification discloses that "a first layer of material 34, 36 has a high specific heat capacity and is thermally conductive. The first layer of material includes a first half shell 34 and a second half shell 36" (pg. 5, lines 23-27). However, the specification does not disclose an outer layer of thermally insulating material that also comprises first and second half shells.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), and further in view of Maggert et al (US 6724170).

Regarding claims 1-3, the Stafford reference discloses a battery pack comprising: a plurality of battery cells "22" wherein the battery cells are elongate and aligned parallel and side by side (Fig. 5); a plurality of electrical contacts "34" (electrical leads) that are capable of coupling the battery cells to an intrinsically safe hand held instrument (col. 4, lines 9-10); wherein housing support "26" comprising two split shell segments "26a" and "26b" (first and second half shells) that contacts the cylindrical surface of the battery cells, wherein the split shell segments have a gap therebetween that is capable of allowing thermal expansion of the split shell segments (Fig. 1 and col. 4, lines 31-33); wherein the first and second half shells extend in parallel planes and enclosing the plurality of battery cells (Figs. 1 and 5); wherein housing support "26" comprises: a first heat-conductor layer "42" (thermally conductive material/interior layer) that is shaped to conform to a cylindrical portion of the outer surface of the battery cells, terminates at interior layer ends that are on the cylindrical portion of the outer surface of the battery cell, and has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K (col. 4, line 56 to col. 5, line 18 and Fig. 4); and a second structural support outer layer "48" (thermally insulating material/outer layer) that is shaped to conform to an outer surface of the first heat-conductor layer, contacts all of the outer surface of the first heat-conductor layer, extends beyond the outer surface to enclose the interior layer ends, defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, and has a thickness of 0.020 inches and a second value of thermal conductivity (col. 5 lines 23-26 and Fig. 4).

Examiner's note: the recitation "for an intrinsically safe hand held portable instrument in an industrial process control system" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In addition, it is well known in the art that battery cells in a battery pack are connected to one another with a plurality of electrical interconnects. For example, Maggert et al (US 6724170) discloses electrical interconnects "110" that connect adjacent cells "101"- "104".

Further, it is the position of the examiner that "the interior layer of material spreads flow of the heat over a portion of the outer surface of the interior layer that is larger than the hot spot and the outer layer of material retards flow of the heat to an outer surface of the outer layer" and "the temperature of the outer surface of the outer layer has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition" are inherent properties of a battery cell that has a interior layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the battery cell and an outer layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the interior layer. In addition,

the Stafford battery pack is also an intrinsically safe equipment because of the inherent properties of the battery housing support.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound (claim 1). The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal "16" (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film "18" (potting compound) (Fig. 9 and 13 and paragraphs [0206],[0211]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery.

However, Stafford et al as modified by Izaki et al does not expressly teach a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support (claim 1). The Maggett reference discloses a plurality of plastic casings "202", "501", "502" (elongated separation bars) positioned between the adjoining cells and between the plurality of electrical interconnects "110" to prevent shorting (col. 3 line 66 to col. 4 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery pack to include a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support in order to improve the safety of the battery by preventing the tabs from shorting to either tabs or other cell housings.

8. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al (US 6724170) as applied to claim 1 above, and further in view of Dansui et al (US 2003/0013009).

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach a first layer of material that comprises aluminum or copper (claims 4 and 5). The Dansui reference discloses a battery housing that is made of aluminum or copper (paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert battery housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

9. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al

(US 6724170) as applied to claim 1 above, and further in view of Toyoda (JP 2001-243927).

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach a second layer of material that comprises heat-shrink tubing or elastic material. The Toyoda reference discloses a heat shrink member "8" that is also an elastic material that covers a battery (paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert battery housing support to include a second layer of material that comprises heat-shrink tubing or elastic material in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

Response to Arguments

10. Applicant's arguments filed 1/7/11 have been fully considered but they are not persuasive.

The applicants argue that support for the configuration in which the first layer is thermally conducting and the second layer is thermally insulating can be found at Figure 8, elements 120 and 122 which are described generally at page 8, lines 26 through page 10, line 2.

In response, the examiner would like to point out that Figure 8 does not show a first layer 120 and second layer 122 that each comprise a first half shell and a second

half shell. In fact, Figure 8 refers to Figures 1-3 which show only a first layer comprising a first half shell and a second half shell.

The applicants further argue that the cited references do not show half shells which extend in planes.

In response, the examiner disagrees because Stafford et al shows in Figures 1 and 2, a first half shell and a second half shell that extend in parallel planes.

The applicants further argue that the claimed half shells are described as enclosing the plurality of electrical energy storage cells. This also is not shown in the cited references.

In response, the examiner would like to point out that there is no support for a single first half shell and a single second half shell enclosing the plurality of electrical energy storage cells. Each first half shell and second half shell enclose a single electrical energy storage cell.

The applicants further argue that the claims describe a gap between the first and second shells to allow thermal expansions of the half shells during heating. This is also not shown in the cited references.

In response, the examiner contends that Figures 1 and 2 of Stafford et al do show a gap between the first and second half shells.

The applicants further argue that the cited references do not describe a first (interior) layer which is thermally conductive and an outer layer which is thermally insulating. This is not shown as noted in Stafford in which the only configuration

described are first and second layers having the same heat conductivity (column 5, lines 27-30 of Stafford).

In response, the examiner contends that Stafford does not necessarily disclose first and second layers that have the same heat conductivity. Stafford discloses in column 5, lines 57-59, "The heat-conducting fibers 44 of the heat-conducting inner layer 42 (first layer) conduct heat from the wall of the battery cell housing.". Stafford also discloses in column 5, lines 24-26, "The structural support outer layer 48 (second layer) is a composite material, preferably comprising structural fibers 50 embedded in a polymeric matrix 52.". Therefore, the examiner contends that the polymer matrix component of the structural support outer layer renders the layer thermally insulating.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on (571) 272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Ula C Ruddock/
Supervisory Patent Examiner, Art Unit 1729